

# **GOA Arrowtooth flounder**

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## **Executive Summary**

The 2003 survey biomass and length data were added to the model for the 2003 assessment. Catch and fishery length data for 2002 were updated and 2003 catch and fishery length data were added to the model. An age-based model was used with the same configuration as the 2002 assessment. The fishery selectivities were estimated using a smooth function as in the 2002 assessment model. Natural mortality for males was set higher than for females as in previous assessments, to obtain a sex ratio of about 70% female in the population. Length composition data were fit using a fixed length-age transition matrix estimated from survey length at age data.

Catch through 9 October 2004 was 15,128 t a decrease from the 2003 catch of 23,316 t (Table 1). Survey biomass estimates from Halibut trawl surveys in the 1960's, groundfish trawl surveys in the 1970's and NMFS triennial trawl surveys from 1984 to 2003 were included in the model. The 2003 survey biomass was 2,822,830 t, an increase from the 2001 survey biomass of 1,621,892 (including an estimated biomass for the eastern gulf, which was not surveyed in 2001). The estimated biomass from the model increased from 327,622 t in 1961 to a high of 2,391,550 t in 2003. The 2004 ABC using F40% was 194,934 t, up considerably from the 2003 ABC of 155,139 t. OFL using F35% was 228,134 t. Projected 2005 spawning biomass was 1,229,280 t with an ABC (fishing at F40%) of 186,680 t (Tables 2 and 3). Projected 2005 spawning biomass is above B40% = 620,336 t (Table 4).

Table 1. Gulf of Alaska flatfish catch (t) through October 9, 2004.

Species	Western	Central	West Yakutat	East Yakutat/SE	Total
Arrowtooth flounder	2,779	12,240	76	33	15,128
Shallow water flatfish	129	2,808	1	0	2,938
Deep water flatfish(Dover sole)	9	614	55	4	682
Flathead sole	820	1,540	0	0	2,360
Rex sole	499	942	0	0	1,441

Table 2. Projected ABC and OFL for 2004 to 2008 by INPFC area for Gulf of Alaska arrowtooth flounder.

**Arrowtooth ABC by INPFC area**

	Western	Central	West Yakutat	East Yakutat/SE	Total
F=F40%					
2004	23,591	151,843	10,593	8,907	194,934
2005	22,592	145,414	10,144	8,530	186,680
2006	21,614	139,117	9,705	8,161	178,597
2007	20,698	133,221	9,294	7,815	171,027
2008	19,633	126,365	8,816	7,412	162,226
F=F35%					
2004	27,609	177,704	12,397	10,424	228,134
2005	25,946	167,002	11,651	9,796	214,395
2006	24,407	157,097	10,960	9,215	201,679
2007	23,021	148,177	10,337	8,692	190,227
2008	21,535	138,610	9,670	8,131	177,946

Table 3. Projected female spawning biomass and yield from 2004 to 2008 for Gulf of Alaska arrowtooth flounder.

Year	Female spawning biomass(t)	Yield(t)
F=F40%		
2004	1,306,640	194,934
2005	1,229,280	186,680
2006	1,167,590	178,597
2007	1,123,810	171,027
2008	1,074,210	162,226
F=F35%		
2004	1,306,640	228,134
2005	1,202,840	214,395
2006	1,119,800	201,679
2007	1,058,730	190,227
2008	995,345	177,946
F=0.010(avg F)		
2004	1,306,640	14,962
2005	1,374,820	15,810
2006	1,447,960	16,539
2007	1,530,710	17,201
2008	1,599,490	17,644
F=0.5 F40%		
2004	1,306,640	100,136
2005	1,305,690	101,106
2006	1,310,920	101,447
2007	1,326,560	101,480
2008	1,329,460	100,285
F=0		
2004	1,306,640	0
2005	1,387,010	0
2006	1,472,840	0
2007	1,568,820	0
2008	1,651,250	0

Table 4. Summary of results of arrowtooth flounder assessment in the Gulf of Alaska.

Natural Mortality	0.2 females 0.35 males
Age of full(95%) selection	9 females, 12 males
Reference fishing mortalities	
$F_{40\%}$	0.142
$F_{35\%}$	0.168
Biomass at MSY	N/A
Equilibrium unfished Female Spawning biomass	1,550,840 t
$B_{40\%}$ Female Spawning biomass fishing at $F_{40\%}$	620,336 t
$B_{35\%}$ Female Spawning biomass fishing at $F_{35\%}$	542,794 t